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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,932	08/26/2003	Jackson Jarrell Pair	028080-0109	3088

7590 06/19/2007

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2628	

MAIL DATE	DELIVERY MODE
06/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/647,932	PAIR ET AL.	
	Examiner	Art Unit	
	Michelle K. Lay	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29,32 and 37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29,32 and 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed 05/14/2007 has been entered and made of record. The remarks concerning the 35 USC 101 rejection made in the Non-Final office action filed 02/13/2007 has been considered. The 35 USC 101 rejection is withdrawn. Claims 30, 31, and 33-36 have been cancelled. Claims 1-29, 32, and 37 are pending.

Please note: Attempt to reply to Interview Request filed 05/14/2007 was made, but no response was given.

Response to Arguments

In regards to claim **1**, Applicant's arguments, filed 12/19/2006, have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection in view of Ohshima et al. (2003/0032484 A1) in view of Richey (5,310,794), Lyons (6,181,343 B1) and Sauer (2002/0140708 A1) is made below. Applicant argues the newly amended claims require the integrated scene is directly viewable by the individual. The new grounds of rejection made in view of Ohshima et al. (2003/0032484 A1) in view of Richey (5,310,794), Lyons (6,181,343 B1) and Sauer (2002/0140708 A1) teaches being able to view virtual images without having to use an HMD [0052].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claim **32** is rejected under 35 U.S.C. 103(a) as being unpatentable over Richey (5,310,794) in view of Lyons (6,181,343 B1).

Richey teaches the limitations of claim 32 with the exception of disclosing updating the sequence of images. However, Lyons teaches manipulating the information on a large-screen display, in response to interaction with the user.

Richey discloses a panoramic image based virtual reality display system. Referring to Fig. 34, the viewer's entire body is positioned in the large display assembly (23), in which display units surround the viewer such that the viewer sees a respective portion of the scene of spherical coverage in any viewable direction. The large display assembly (23) is comprised of a structural framework (9) and supports (10), which hold the display units (11) and optical enlarging means (12) securely in place [col. 9 lines 14-23)]. The floor (130) and its associated display unit (11) beneath, to the sides, and over the viewer/operator are integrated so the viewer is presented with a substantially continuous scene for viewing [col. 28 lines 15-19]. Display systems and optical enlargement means mounted on spring-hinged doors, latches, or rollers, allow the entry and exit assembly (131) to move back and forth in an open and closed position to enable viewer entry and exit [col. 28, lines 28-32]. These means may also be used for

easy assembly and disassembly. Richey discloses that it is further foreseen that the optical and camera arrangements disclosed in Figs. 6-17 may transmit their recorded image to various types of sensors such as visual, motion detection, and pyroelectric sensors [col. 34 lines 57-61].

Lyons teaches a system and method for permitting three-dimensional navigation through a virtual reality environment. The video image display means displays three-dimensional graphical objects within the virtual reality environment, and movement by the system users causes apparent movement of the three-dimensional objects displayed on the video image display means so that the system user appears to move throughout the virtual reality environment [col. 6 lines 22-28]. Additionally, as described in Fig. 6, by taking a step forward, user (62) causes SBIP (60) to move graphical images (92) on display screen (54) so that the user (62) appears to be moving forward through virtual reality environment (94). Furthermore, the user can move left, right, stop or in reverse, and the SBIP (60) updates the graphical images (92) accordingly on the display screen (54) [col. 9 line 37 – col. 10 line 10].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display units of Richey with the SBIP of Lyons in order for the user to be in an immersive display. This provides the advantage of giving the user the impression of being "in" the virtual reality environment [Lyons: col. 1 lines 30-41] as well as allowing the users to navigate through and control the objects in the virtual reality environment through normal body movements [Lyons: col. 3 lines

50-55]. Furthermore, the updating of Lyons adds realism to the interaction with the computer [Lyons: col. 6 lines 50-53].

2. Claims **1-4**, **11-17**, **20-23**, **29**, and **37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al. (2003/0032484 A1) in view of Richey (5,310,794), Lyons (6,181,343 B1) and Sauer (2002/0140708 A1).

Ohshima teaches the limitations of claims **1-4**, **11-17**, **20-23**, and **37** with the exception of teaching updating the sequence of images and a structure that is large enough to accommodate an individual. However, Lyons teaches manipulating the information on a large-screen display, in response to interaction with the user and Richey teaches a panoramic image based virtual reality display system where the viewer's entire body is positioned in the large display assembly (23), in which display units surround the viewer such that the viewer sees a respective portion of the scene of spherical coverage in any viewable direction.

In regards to claims **1-4**, **14-16**, and **37**, Ohshima disclose a game apparatus within mixed reality. The locations of the player and real object are detected, and the relative positional relationship between the player or real object, and the virtual object is recognized [*abstract*]. As shown in Figs. 2 and 3, table (100) has real objects that appear in the game. The real objects (101, 104) have location sensors (103) so that the virtual images of the game can behave accordingly. The HMD worn by the user displays the virtual object (102) as well as the table [0100-0103].

Sauer teaches an augmented reality environment comprising a stereo display (224) of Fig. 1, a 2D/3D graphics module (270), and a video and graphics overlay module (222). The two video cameras (210a-b) and the stereo display (224) are employed to obtain 3D perception [0052]. The two video cameras (210a-b) provide image related data corresponding to the real world to the system (200). The data provided by the tracking module (212) allows for the relationship(s) between the preceding coordinate systems to be known or finally calculated in the pose calculation module (218) [0053].

Richey discloses a panoramic image based virtual reality display system. Referring to Fig. 34, the viewer's entire body is positioned in the large display assembly (23) (claims **1**, **37**), in which the viewer is surrounded by display units such that the viewer sees a respective portion of the scene of spherical coverage in any viewable direction (claims **1**, **2**, **37**) [col. 9, lines 14 – 19)]. The assembly is designed to facilitate a single or plural number of viewers (claim **16**) [col. 28, lines 14 – 15]. The large display assembly (23) is comprised of a structural framework (9) and supports (10), which hold the display units (11) and optical enlarging means (12) securely in place [col. 9, lines 20 – 23)]. The floor (130) and its associated display unit (11) beneath, to the sides (claim **4**), and over the viewer/operator (claim **3**) are integrated so the viewer is presented with a substantially continuous scene for viewing [col. 28, lines 15 – 19]. Display systems and optical enlargement means mounted on spring-hinged doors, latches, or rollers (claim **15**), allow the entry and exit assembly (131) to move back and forth in an open and closed position to enable viewer entry and exit [col. 28, lines 28 – 32]. These means may also be used for easy assembly and disassembly (claim **14**). Components

of the display assembly cooperate to display a substantially continuous panoramic scene of spherical coverage about the viewer [col. 9, lines 33]. The panoramic scene consists of a plurality of image segments that form a composite image on a single video frame (claims **1**, **37**). Image segments represent portions of camera recorded scene or computer graphic information. Typically the segments represent adjacent portions of the surrounding panoramic scene. Each image segment is displayed at a designated area within the display assembly such that the recorded scene is re-formed in the same geometric or geographic orientation in which the scene was recorded [col. 9, lines 48 – 54].

Therefore, it would have been obvious to one in the art at the time the invention was made to modify the invention of Ohshima to project the virtual image of the game on the wall displays of Richey in order eliminate the use of the HMD implementing the stereo displays of Sauer. This would provide realism to the user by not having to wear extra equipment to view and interact with the virtual images and real objects of Ohshima as if they are same type of object.

Lyons teaches a system and method for permitting three-dimensional navigation through a virtual reality environment. The video image display means displays three-dimensional graphical objects within the virtual reality environment, and movement by the system users causes apparent movement of the three-dimensional objects displayed on the video image display means so that the system user appears to move throughout the virtual reality environment [col. 6, lines 22-28]. Additionally, as described in Fig. 6, by taking a step forward, user (62) causes SBIP (60) to move graphical

images (92) on display screen (54) so that the user (62) appears to be moving forward through virtual reality environment (94). Furthermore, the user can move left, right, stop or in reverse, and the SBIP (60) updates the graphical images (92) accordingly on the display screen (54) [col. 9, line 37 – col. 10, line 10].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the display units of Richey with the SBIP of Lyons in order for the user to be in an immersive display. This provides the advantage of giving the user the impression of being "in" the virtual reality environment [col. 1 lines 30-41] as well as allowing the users the computer users to navigate through and control the objects in the virtual reality environment through normal body movements [col. 3 lines 50-55]. Furthermore, the updating of Lyons adds realism to the interaction with the computer [col. 6 lines 50-53].

In reference to claims **11–13**, Richey illustrates in Fig. 6 the input means for recording a panoramic scene of spherical coverage, which is the panoramic camera system including a camera (43), and which comprises a portable panoramic video viewing and recording system (27), referred to as a panoramic camcorder. The panoramic camcorder (27) is carried by a host or vehicle [col. 10, lines 6-13]. It may be obvious to one in the art that the images captured by the panoramic camcorder (27) may comprise images from the real environment (claim **12**). Referring to Figs. 9-12, the optical elements (41) are interfaced with the camera (43) to facilitate the composite image (26) being transmitted to the recording surface (42) of the camera (43) by conventional

means. The recording surface (42) is directly associated with an image processor means (44) of a self-scanning solid state imaging device such as a charge coupled device located in the image plane of each respective lens element (41) (claim **13**) [col. 11, lines 57-65]. Referring to Figs. 6-10 and 15-17, the electrical section (45) is structured to convert the visual images received by the image processor (44) into electrical video signals [col. 12, lines 66-68] such that the information is in a format that is compatible with standard video processing equipment [col. 13, lines 1-2]. As shown in Fig. 6 and 9, the picture signal from the camera (43) is then transferred through conductor (46) to a conventional portably structured videotape recorder/player (47) [col. 13, lines 14-17]. The television signal is then stored by the recorder/player (47) on videotape (claim **11**) [col. 13, lines 29-30]. Additionally, Lyons teaches displaying live video of a camera input of a remote site (claim **13**) [col. 7, lines 10-21]. The same rationale for combining as applied to claim 1 is incorporated herein.

Regarding claim **17**, it would have been obvious to one in the art that the real objects of Ohshima may include objects that coincide with what is displayed on the screen, allowing for a simulated environment to the user within the display assembly of Richey in view of Lyons. The same rationale for combining as applied to claim 1 is incorporated herein.

In reference to claim **20**, Ritchey discloses that is may be foreseen that the display assembly [Fig. 32 (23)] may be used as a simulator for various kinds of vehicles [Fig. 55

(149)]. Referring to Figs. 54 and 55, the device might take the form of simulated controls (150) for such vehicles (149) as a land, sea or air vessel as claimed [col. 34, lines 34-40]. The same rationale for combining as applied to claim 1 is incorporated herein.

In regards to claims **21-23**, Lyons discloses incorporating audio features to provide voice-recognized commands from the system user and sound effects to the display screen [col. 13, lines 38-42]. Although Lyons does not explicitly disclose a sound generating apparatus, it is implicit that the audio/visual monitor system of Lyons [col. 7, lines 65-68] includes some type of sound generating apparatus in order to provide sound effects to the display screen. The same rationale for combining as applied to claim 1 is incorporated herein.

In regards to claim **29**, Richey discloses a stereographic field of view is arrived by sampling left and right eye fields of either of side of the orientation defined by the position sensors [Fig. 26 (97)]. To achieve a stereographic effect, image segments [Fig. 29 (13)] for the left eye and right eye are chosen from two adjacent objective lenses [Fig. 17 (37)], each with a different, but adjacent, overlapping field of view of the visual scene. Fig. 30 illustrates the resultant stereoscopic image (101) that the image processing system has processed for stereographic display [col. 21 lines 50-62].

Sauer teaches an augmented reality environment comprising a stereo display (224) of Fig. 1, a 2D/3D graphics module (270), and a video and graphics overlay

module (222). The two video cameras (210a-b) and the stereo display (224) are employed to obtain 3D perception [0052]. The two video cameras (210a-b) provide image related data corresponding to the real world to the system (200). The data provided by the tracking module (212) allows for the relationship(s) between the preceding coordinate systems to be known or finally calculated in the pose calculation module (218) [0053]. The same rationale for combining as applied to claim 1 is incorporated herein.

3. Claims **5-10**, **18**, and **19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al. (2003/0032484 A1) in view of Richey (5,310,794), Lyons (6,181,343 B1) and Sauer (2002/0140708 A1) as applied to claims 1-4 above, and further in view of Santodomingo et al. (7,038,694 B1).

The modified invention of Ohshima teaches the limitations of claims **5-10**, **18**, and **19** with the exception of explicitly disclosing wallpaper. However, Santodomingo teaches data defining one or more graphic objects are automatically generated in a repeatable manner within each of a plurality of visual tiles of a simulated space.

In regards to claim **5**, the method/system of Santodomingo produces an automatic scenery generator to produce landscape as a background [col. 7 lines 51-58]. The techniques of Santodomingo enable the use of tiles in a more versatile fashion over any type of surface, such as a fictitious world, or a simulated wall [col. 8 lines 27-31]. The terrain classes designated at the corners of a tile are used to establish a 2D scenery

texture for the tile. A texture may be derived from a digital aerial photograph or other graphical rendition of a desired surface for the tile. A single scenery texture can be used for a tile with all four corners designated with the same terrain class [col. 8 lines 41-47]. A number of graphically designed texture variations of the same terrain class are provided, so that different texture variations can be applied to adjacent tiles that have the same terrain class without creating a surface on which repeating patch of exactly the same texture is evident [col. 8 lines 52-56]. As illustrated in Fig. 8, Santodomingo illustrates wall texture.

Therefore, it would have been obvious to one of ordinary skill in the art to implement the automatic scenery generator of Santodomingo with the modified invention of Ohshima in order to provide realism to a virtual environment i.e., the display assembly of Richey [Santodomingo: col. 1 lines 15-17]. The scenery texture can be implemented by the computer graphics system (6) as shown in Fig. 32 of Richey, and displayed on the display walls.

In regards to claims **6-9**, Ohshima teaches integrating real objects within a mixed reality system (see rationale of claim 1). Furthermore, it would have been obvious to one of ordinary skill in the art to place real objects, such as an operable door and windows with shutters, into the display assembly of Richey in order to create realism of the augmented reality environment.

In regards to claims **10** and **18**, the techniques of Santodomingo enables the use of tiles in a more versatile fashion over any type of surface, such as a fictitious world, or a simulated wall [col. 8 lines 27-31]. Furthermore, each tile may instead correspond to any desired subdivision [col. 8 lines 10-12]. Therefore, it would have been obvious to one of ordinary skill in the art to display fictitious worlds behind the real objects, such as a door or window, to provide realism to the user within the display assembly of Richey. Furthermore, by having the ability to apply different textures to difference parts of the display, the walls (i.e. displays) of Richey would be apply to simulate different fictitious worlds, i.e., a plurality of different rooms, of say, within a home. Furthermore, it would have been obvious to one of ordinary skill in the art to "decorate" such rooms with the real objects as taught by Ohshima, to provide a realism within the augmented reality environment.

In regards to claim **19**, the techniques of Santodomingo enable the use of tiles in a more versatile fashion over any type of surface, such as a fictitious world, or a simulated wall [col. 8 lines 27-31]. Therefore, with the same rationale as applied to claim 5, the fictitious world can be an alleyway.

4. Claims **21**, **24**, **26**, and **28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al. (2003/0032484 A1) in view of Richey (5,310,794), Lyons (6,181,343 B1) and Sauer (2002/0140708 A1) as applied to claim 1 above, and further in view of Latypov et al. (6,563,489 B1).

The modified invention of Ohshima teaches the claimed limitations of claims **21**, **24**, **26**, and **28** with the exception of including a computer-controlled sensory generator, other than a display. However, Latypov teaches a system for immersing a user in a virtual reality that includes controlling the temperature and air content.

Referring to Fig. 13 of Latypov, the system of Latypov comprises means (30) to control temperature and air content in the sphere (claims **26**, **28**), which is an air conditioner (claims **21**, **24**) [col. 6, lines 29-31]. Additionally, the sphere of Latypov

Therefore, it would have been obvious to one of ordinary skill in the art to include the temperature and air generating conditions of Latypov within the display assembly of Ohshima in view of Richey and Lyons because the added environmental changes (i.e. additional sensory) enhances the virtual environment to portray to the user that he/she is in a real atmosphere.

5. Claims **21**, **24**, and **25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al. (2003/0032484 A1) in view of Richey (5,310,794), Lyons (6,181,343 B1) and Sauer (2002/0140708 A1) as applied to claim 1 above, and further in view of Tanide et al. (6,201,516 B1).

The modified invention of Ohshima teaches the claimed limitations of claims **21**, **24**, and **25** with the exception of including a computer-controlled sensory generator, other than a display. However, Tanide teaches a system for sensation.

Tanide teaches the operation floor (66) [Fig. 11, 12] is controlled via the motion drive device (22d) (claims **21**, **24**). The floor (66) can be vertically moved, twisted, tilted, or displayed (claim **25**) [col. 12, line 61 – col. 13, line 21].

Therefore, it would have been obvious to one of ordinary skill in the art to include the floor operation of Tanide within the display assembly of the modified invention of Ohshima because the added environmental changes (i.e. additional sensory) enhances the virtual environment to portray to the user that he/she is in a real atmosphere.

6. Claims **21** and **27** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohshima et al. (2003/0032484 A1) in view of Richey (5,310,794), Lyons (6,181,343 B1) and Sauer (2002/0140708 A1) as applied to claim 1 above, and further in view of Dowling et al. (2003/0057884 A1).

The modified invention of Ohshima teaches the claimed limitations of claims **21**, and **27** with the exception of including a computer-controlled sensory generator, other than a display. However, Dowling teaches system consisting of a virtual world in coordination with information received from the display.

Dowling teaches using LED lighting systems (or other types of lighting systems) for enhancement of computer game where there is a user in a real world environment that surrounds the display screen [0037]. The computer software need not be a game, but of any type of computer application [0036]. In use, the illumination system can be used to provide information to the user (101) in response to or in coordination with the information being provided to the user (101) by the video display (104). One example of

how this can be provided is in conjunction with the user playing a computer game on the computing device (103). The light system may be used to create one or more light effects in response to action on the video display (104) [0049].

Therefore, it would have been obvious to one of ordinary skill in the art to include the floor operation of Dowling within the modified display assembly of Ohshima because the added environmental changes (i.e. additional sensory) enhances the virtual environment to portray to the user that he/she is in a real atmosphere.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle K. Lay whose telephone number is (571) 272-

7661. The examiner can normally be reached on Monday through Thursday from 7:30am to 5:00pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee M. Tung, can be reached at (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michelle K. Lay
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06.11.2007 mkl

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